

### REMARKS

Reconsideration of the present application is respectfully requested.

Claims 18, 22, 24 and 25 have been rejected under 35 U.S.C. 102(b) as being anticipated by Imamura. This rejection is respectfully traversed.

Imamura describes Nb/ $\text{AlO}_x$ /Nb Josephson junctions shown in Figs. 1a-1b and 2a-2d with junction contacts that are  $1.0\text{ }\mu\text{m}$  square (Fig. 4a) and  $0.7\text{ }\mu\text{m}$  square (Fig. 4b) with associated contact holes of  $3.0\text{ }\mu\text{m}$  square (Fig. 4a) and  $3.0\text{ }\mu\text{m}$  circle (Fig. 4b). See bottom of col. 2, p. 1587.

The Josephson junctions described in Imamura differ from the superconductor integrated circuit recited in claim 18 because, although the junctions are Nb/ $\text{AlO}_x$ /Nb junctions, the anodized  $\text{Nb}_2\text{O}_5$  layer shown in Fig. 2d is disposed around the upper Nb layer but not around the Al- $\text{AlO}_x$  layer. This differs from the anodization ring of the present invention, which as shown in FIG. 6 is disposed around a perimeter of both the counterelectrode layer and the tunnel barrier layer for preventing a short circuit between an outside contact and the base electrode layer.

In addition, the junction contacts in Imamura do not have respective diameters of approximately  $1.00\text{ }\mu\text{m}$  or less as does the tunnel junction region recited in claim 18. This is because the junction contacts described in Imamura are square and therefore cannot have an associated diameter. Only the contact hole, which is shown in Fig. 4d as being formed from  $\text{SiO}_2$ , is described as being circular.

Therefore, as the Examiner has failed to establish a prima facie case of anticipation in view of the above noted differences between Imamura and the present invention, it is respectfully requested that the Examiner's rejection of claim 18, as well as claims 22, 24 and 25 that depend therefrom, under 35 U.S.C. 102(b) be withdrawn.

It should be noted that dependent claims 22, 24 and 25 further distinguish the present invention over Imamura. Specifically, Imamura fails to teach that a tunnel barrier layer, such as the Al-AlO<sub>x</sub> layer disclosed therein, is disposed solely within the anodization ring (anodized Nb). Further consideration of these defining features is respectfully requested, as the Examiner has failed to establish a prima facie case of obviousness with regard to these features.

Claims 18 and 23 have been rejected under 35 U.S.C. 102(b) as being anticipated by Lee. This rejection is respectfully traversed.

Lee describes a technique for fabricating a Josephson trilayer junction sandwich of Nb/AlO<sub>x</sub>/Nb in which an anodized layer of Nb surrounds an upper layer of Nb. However, the junction sandwich described in Lee differs from the superconductor integrated circuit recited in claim 18 because, although the junction sandwich is formed from Nb/AlO<sub>x</sub>/Nb, the anodized Nb layer shown in Fig. 1d surrounds the upper Nb layer but not the Al-AlO<sub>x</sub> barrier layer. As noted above in the discussion of Imamura, this differs from the anodization ring of the present invention, which as shown in FIG. 6 is disposed around a perimeter of both the counterelectrode layer and the tunnel barrier layer for preventing a short circuit between an outside contact and the base electrode layer.

In addition, regarding claim 23, the Examiner appears to be basing his rejection at least partially on the assumption that the anodization process would necessarily extend into the underlying base Nb electrode, and that this process step would be inherent to one skilled in the art rather than on what is actually taught by Lee.

It is well established that the Patent Office bears the duty to establish a prima facie case under 35 U.S.C. 102(b) or any of the patent laws by supplying evidence that the statutory requirements for patentability are unmet. To properly establish anticipation, the applied reference

must teach every element of the claim (MPEP 2131). It is further established that a claim of inherency generally applies to *minor and commonly known aspects* of a claimed invention. In making a claim of inherency, the Office is still under a burden to establish that a gap filled with a claim of inherency can be supported, for example, through the application of extrinsic evidence. In the present rejection, no such evidence has been provided to support the assertion that the anodization process would necessarily extend into the underlying base Nb electrode given the fact that Lee specifically indicates that the top Nb layer is partially etched. Even assuming arguendo that such would be the case, how would such an etch result in, for example, the anodization ring as recited in claim 18?

The Examiner has failed to establish a prima facie case of anticipation in view of the above noted differences between Imamura and the present invention. Therefore, it is respectfully requested that the Examiner's rejection of claim 18, as well as claim 23 that depends therefrom, under 35 U.S.C. 102(b) be withdrawn.

Claims 18, 22, 24 and 25 have been rejected under 35 U.S.C. 103(a) as being obvious in view of Imamura. This rejection is respectfully traversed.

Imamura is deficient in its teachings for the above noted reasons. Specifically, the Josephson junctions described in Imamura differ from the superconductor integrated circuit recited in claim 18 because, although the junctions are Nb/ $\text{AlO}_x$ /Nb junctions, the anodized  $\text{Nb}_2\text{O}_5$  layer shown in Fig. 2d is disposed around the upper Nb layer but not around the Al- $\text{AlO}_x$  layer. This differs from the anodization ring of the present invention, which as shown in FIG. 6 is disposed around a perimeter of both the counterelectrode layer and the tunnel barrier layer for preventing a short circuit between an outside contact and the base electrode layer.

Therefore, the Examiner has failed to establish a prima facie case of obviousness, as Imamura fails to teach or suggest this claimed feature of the present invention. Withdrawal of the rejection of claim 18, as well as claims 22, 24 and 25, under 35 U.S.C. 103(a) is therefore respectfully requested.

Claim 19 has been rejected under 35 U.S.C. 103(a) as being obvious in view of Imamura and Applicant's prior art admissions (APA).

Claim 19 depends from claim 18, which is allowable for the above discussed reasons. Therefore, claim 19 is allowable at least by virtue of its dependency on claim 18.

Claims 20 and 21 have been rejected under 35 U.S.C. 103(a) as being obvious in view of the combination of Imamura and Kerber.

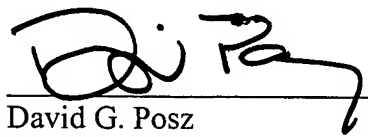
Claims 20 and 21 ultimately depend from claim 18, which is allowable over the art of record for the above discussed reasons. Therefore, claims 20 and 21 are allowable at least by virtue of their dependency on claim 18.

The Examiner should note that new claim 26 has been added to recite additional features of the anodization ring recited in claims 18 and 23 in a manner that is supported by both the specification and the drawings. See, for example, FIG. 9B.

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In view of the above remarks, the present application is believed to be in condition for allowance. A prompt notice to that effect is respectfully requested. Although no additional fees are believed to be due, permission is hereby given to charge any fees to deposit account 50-1147.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. G. Posz', written over a horizontal line.

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